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Peter P. Scott
c/o Connie Del Castillo
LSI Logic Corporation
1551 McCarthy Boulevard, M/S D-106
Milpitas, CA 95035

EXAMINER	
ZERVIGON, RUDY	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/942,330
Filing Date: August 29, 2001
Appellant(s): WILLIAMS ET AL.

James D. Wood
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 16, 2007 appealing from the Office action mailed May 10, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 4311671 A	Notman; Alan	01-1992
US 4747367 A	Posa; John G.	05-1988
US 5137701 A	Mundt; Randall S.	08-1992

US 5384051 A McGinness; Thomas G. 01-1995

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 8, 10, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alan Notman (USPat. 4,311,671) in view of Posa; John G. (US 4,747,367 A). Alan Notman teaches a catalytic gas reactor (Figure 1; column 6, line 59 – column 7, line 31) including:

i. An enclosure (10) which defines an interior void (Figure 1) and a longitudinal axis down the center of item 42

ii. A first partition (16A; column 6, lines 59-68) having a first orifice ("central hole"; column 2, lines 1-15; column 7, lines 3-7) defined therein, the first partition being positioned within the interior void such that:

   a. The first partition divides the interior void into a first chamber (12A) and a second chamber (12B) and

   b. The first orifice is in fluid communication with the first chamber and the second chamber (Figure 1; column 7, lines 3-7)

iii. A gas connector (conduit 34) which has:

   a. A passageway (34) defined there through and

   b. A gas port (30) in fluid communication with the passageway and supplied by a gas source (see arrow entering 30; column 7, lines 1-10), the passageway having

an inlet (34) and an outlet (32) and being in direct fluid communication with the first chamber (12A) of the enclosure

c. The gas source is advanced into the passageway (34) of the gas connector (conduit 34) via conduit 26

d. The gas port (30) being downstream of the gas connector inlet (34) and downstream of the gas connector outlet (32)

iv. A gas dispenser (28A/B) in direct fluid communication with the second chamber (12B) of the enclosure; and

v. An exit port (50) in fluid communication with the interior

vi. A second partition (16B) having a second orifice (holes in 16B, not labeled, see crossing arrows indicating flow) therein wherein

a. The second partition is positioned within the second chamber (12B)

b. The first orifice has a first central axis (collinear to central axis of 42) and being aligned (colinear) with the longitudinal axis of the enclosure, the first central axis is further unobstructed such that gas can pass (see flow arrows) from the first chamber to the second chamber through the first central axis

c. The second orifice (holes in 16B other than 42, not labeled, see crossing arrows indicating flow) has a second central axis and the second central axis of the second orifice is offset (see Figure 1) relative to the first central axis of the first orifice

Alan Notman further teaches water vapor gas source ("boiler"; column 6, lines 32-35; column 4, lines 55-60; Table 1 - column 10, lines 40-60). Further, it is well established that in apparatus

claims it is inherent that Alan Notman's gas processing apparatus can process water vapor gas. It is well established that apparatus claims must be structurally distinguished from the prior art (In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does ."(emphasis in original) Hewlett - Packard Co . v. Bausch & Lomb Inc ., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), MPEP – 2114)

Alan Notman does not teach that his gas port (30) is upstream of the gas connector outlet (32).

Posa teaches a gas mixing manifold assembly (222; Figure 3; column 7, lines 20-56) including a gas connector (222; Figure 3) with plural gas ports (outlets from valves 210,212; Figure 3; 106/108; Figure 4) located upstream of the gas connector (222; Figure 3) outlet (222/216 interface; Figure 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Alan Notman's gas connector (conduit 34) with Posa's gas connector (222; Figure 3).

Motivation to replace Alan Notman's gas connector (conduit 34) with Posa's gas connector (222; Figure 3) is for adding plural reactive gas source inlets as taught by Posa (column 5; lines 58-67). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

Claims 3-6, 21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alan Notman (USPat. 4,311,671) in view of Posa; John G. (US 4,747,367 A). Alan Notman and Posa are discussed above. Alan Notman further teaches points on Alan Notman's partitions (16A,B,C) that are collinear with the chamber's longitudinal axis (Figure 1). Alan Notman further teaches adjacent partitions (16A/B; 16B/C) such that each partition forms corresponding sub-chambers by interposing the corresponding partitions (Figure 1). Alan Notman further teaches partition

orifice that are in direct fluid communication (see arrows in Figure 1) with the first chamber and the corresponding sub-chamber. Alan Notman further teaches an end wall (22c, Figure 1).

Alan Notman further teaches plural orifice (holes in 16A,B,C; not labeled, see crossing arrows indicating flow) with corresponding central axis where each orifice's central axis is offset relative to the central axis of each other orifice. Alan Notman further teaches a longitudinal axis, as above, that divides the enclosure into a first and second half (Figure 1) where orifice of each partition are either located in the first or second half of the partition.

Alan Notman does not teach partitions, in Figure 1, beyond 3. As a result, Alan Notman does not teach fourth, fifth, and sixth partitions resulting in corresponding fourth, fifth, and sixth sub-chambers.

Alan Notman does not teach that his first and second orifice comprise the largest orifice in his first and second partitions respectively such that the central axis of the first and second orifice are offset relative to each other.

Alan Notman does not teach his gas port disposed between the inlet and outlet of his passageway.

Posa teaches a gas mixing manifold assembly (222; Figure 3; column 7, lines 20-56) including a gas connector (222; Figure 3) with plural gas ports (outlets from valves 210,212; Figure 3; 106/108; Figure 4) located upstream of the gas connector (222; Figure 3) outlet (222/216 interface; Figure 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to:

a. replace Alan Notman's gas connector (conduit 34) with Posa's gas connector (222; Figure 3)

b. to duplicate Alan Notman's partitions thereby adding additional partitions to Alan Notman's catalytic gas reactor resulting in corresponding fourth, fifth, and sixth sub-chambers

c. to optimize the dimension of Notman's orifice in each of the first and second partitions such that the largest orifice of each partition produce axis that are offset relative to each other

Motivation to replace Alan Notman's gas connector (conduit 34) with Posa's gas connector (222; Figure 3) is for adding plural reactive gas source inlets as taught by Posa (column 5; lines 58-67). Motivation to duplicate Alan Notman's partitions thereby adding additional partitions to Alan Notman's catalytic gas reactor resulting in corresponding fourth, fifth, and sixth sub-chambers, and to optimize the dimension of Notman's orifice in each of the first and second partitions such that the largest orifice of each partition produce axis that are offset relative to each other, and to optimize the dimension (height) of Notman's gas connector passageway such that his gas port disposed between the inlet and outlet of his passageway is to provide for longer residence time for the flowing gasses (column 3, lines 7-8; column 4, lines 12-17). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Further, It is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d

459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04).

Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mundt (USPat. 5,137,701) in view of Alan Notman (USPat. 4,311,671) and Posa; John G. (US 4,747,367 A). Mundt teaches an etch apparatus (12, Figure 1; column 1, lines 22-34) which generates an etch gas product (down stream of item 12), where the etch gas apparatus being in fluid communication with an enclosure (Figure 3) defining the process effluent abatement arrangement (18, 32, 16, 20, 36; Figure 1; column 5, lines 13-38).

Alan Notman and Posa are discussed above. However, Alan Notman and Posa do not teach an etch apparatus which generates an etch gas product, where the etch gas apparatus being in fluid communication with the gas connector such that the etch gas product generated by the etch apparatus is advanced into the interior void of the enclosure defining the process effluent abatement arrangement.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus.

Motivation to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus is to reduce the hazardous process chemicals from the etch reactor as taught by Mundt (column 1, lines 22-33).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alan Notman (USPat. 4,311,671) and Posa; John G. (US 4,747,367 A) in view of Thomas G. McGinness. (USPat. 5,384,051). Alan Notman and Posa are discussed above. Alan Notman further teaches heating

elements (60,62) as heat exchangers that are in thermal communication with the gas provided by the gas source at exchanger 62. As a result, Alan Notman does not teach an electrical heating element that is in thermal communication with the gas provided by the gas source. Thomas G. McGinness teaches an electrical heating element (32, Figure 1; column 8, lines 55-62) that is in thermal communication with the gas ("carrier fluid/oxidizer mixture") provided by the gas source.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Alan Notman's heating element with McGinness' electrical heating element.

Motivation to replace Alan Notman's heating element with McGinness' electrical heating element is to provide an alternate and equivalent means for heating.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mundt (USPat. 5,137,701) and Posa; John G. (US 4,747,367 A) in view of Alan Notman (USPat. 4,311,671) and Thomas G. McGinness. (USPat. 5,384,051). Alan Notman, Posa, and Mundt are discussed above. Alan Notman further teaches heating elements (60,62) as heat exchangers that are in thermal communication with the gas provided by the gas source at exchanger 62. As a result, Alan Notman does not teach an electrical heating element that is in thermal communication with the gas provided by the gas source. Thomas G. McGinness teaches an electrical heating element (32, Figure 1; column 8, lines 55-62) that is in thermal communication with the gas ("carrier fluid/oxidizer mixture") provided by the gas source.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add McGinness' heating element to be in thermal communication with the gas provided by the gas source of Alan Notman and Mundt, and to replace Mundt's process effluent abatement

arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus.

Motivation to add McGinness' heating element to be in thermal communication with the gas provided by the gas source of Alan Notman is to control the temperature of the gas provided by the gas source of Alan Notman and Mundt.

Motivation to replace Mundt's process effluent abatement arrangement with Alan Notman's catalytic gas reactor to process the effluent from Mundt's etch apparatus is to reduce the hazardous process chemicals from the etch reactor as taught by Mundt (column 1, lines 22-33).

(10) Response to Argument

Applicant states:

"

In particular, the Examiner has alleged that the motivation to modify Notman would be for the purpose of "adding plural reactive gas source inlets." Office Action at page 5. To provide a convincing line of reasoning for the modification of Notman with the device of Posa, however, the Examiner must show why an artisan of ordinary skill in the art would be motivated to include plural reactive gas source inlets in the system of Notman. This is particularly troublesome since the system of Notman uses catalyst beds to generate the desired chemical reactions, not a reactive gas. (See, e.g., Notman at column 4, lines 18-24). Accordingly, an artisan of ordinary skill in the art would not make provision for the addition of a reactive gas, knowing that reactive gas would not be used.

" (page 10)

And...

"

Moreover, because the suggested combination of references would require a change in the basic principle under which the Notman device was designed to operate, there is no motivation for the proposed combination.

" (page 11)

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Examiner has demonstrated that the prior art has teaching, suggestion, and motivation found in the references themselves and in the knowledge generally available to one of ordinary skill in the art. In particular, Applicant believes the perceived lack of motivation for combining the references stems from the suggested restriction of using the Notman catalyst reactor to "catalyst beds to generate the desired chemical reactions, not a reactive gas". In fact, Notman's catalytic reactor is disclosed as *not* being restricted to reactions at the catalyst-gas interface as suggested by Applicant. Notman specifically details the well known inorganic "shift reaction" that occurs in the presence of water vapor, as *reacting gas* , and Notman's carbon monoxide in the "wet" methanol synthesis (column 4; lines 44-63). The "shift reaction" occurs in the gas phase and is thus independent of the catalyst. The shift reaction produces the desired "crude methanol" (column 4; line 54). Further, the Examiner's grounds for motivation of

"adding plural reactive gas source inlets" is further supported by Notman's inherent citation of reactant, product, and inert gas partial pressures and there influence in the extent of methanol production. Here Notman cites the fact that the recycle stream of gases increases reactants undesirably. As a result, "adding plural reactive gas source inlets" as proposed by the Examiner is consistent with both Notman and Posa's reactors and processes.

Applicant states:

"

Specifically, the Notman device is a synthesis reactor. (Notman at title). The Notman device operates based upon the principle that passing a gas (e.g. a mixture of hydrogen, carbon monoxide and carbon dioxide) over a catalyst bed of solid material (e.g. copper and zinc oxide) will produce a chemical reaction generating a desired output (e.g. methanol). (Notman at column 4, lines 9-44). Thus, in Notman, a mixture of gas is introduced to a solid catalyst bed to obtain a preferred gaseous output.

In contrast, Posa is directed to a vapor deposition device with a constant flow of gas at a constant pressure into a process reaction (deposition) chamber. (Posa at Abstract). Thus, when producing a deposition, the device of Posa mixes a reactive gas with a carrier gas that is directed into the process reaction chamber while a non-reactive gas is vented. (Posa at column 9, lines 23-27 and FIGs. 7 and 8). When the deposition is completed, the device of Posa switches the position of the manifold 22 which causes the non-reactive gas to be mixed with the carrier gas and directed into the process reaction chamber while the reactive gas is vented. (Posa at column 9, lines 27-34 and FIGs. 7 and 8). Thus, in Posa, a mixture of gas is introduced to a reaction chamber to obtain a solid deposition.

"

In response to applicant's argument that Posa and Notman are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Posa and Notman are in the field of Applicant's endeavor (process gas reactors) and are reasonably pertinent to the particular problem with which the applicant was concerned - mixing processed gases for creating a desired product. As the Examiner states above, Notman and Posa *both* conduct gas phase reactions and thus have mutual interests in the number of gas inlets increasing the number of *reactant sources* of gas as identified by the Examiner's motivation.

Applicant states:

"

Accordingly, while the exact process which the Examiner proposes to be used in the modified Norman device is not clear, whatever ultimate design the Examiner intends must include a fundamental change in the basic principle of operation of Notman, such as by replacing the catalyst bed with the reactive gas and/or generating a solid output in place of the gaseous output of Notman. In either event, because Notman and Posa are fundamentally different devices with fundamentally different functions, the proposed modification would require a change in the basic principle under which the Notman device was designed to operate. Therefore, there is no motivation for the proposed combination. In re Ratti, 270 F.2d 810, 813,123 USPQ 349, 352 (CCPA 1959)

“

In response, the Examiner notes that the Examiner's statement for motivation leaves no room for ambiguity as eluded by Applicant above: “Motivation to replace Alan Notman's gas connector (conduit 34) with Posa's gas connector (222; Figure 3) is for adding plural reactive gas source inlets as taught by Posa (column 5; lines 58-67). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).”. Because the cited prior art to Posa and Notman have the common features discussed above, the Examiner believes that such a proposed combination is supported by the prior art at least because of the presence of gas-phase reactions in each reference.

Applicant states:

“

In addition, claims 3-6 contain further limitations directed to additional partitions in the enclosure. The Examiner alleged that the additional partitions would have been an obvious modification of Notman. To this end, the Examiner appears to allege that the motivation to add additional partitions in Notman is that "it is well established that the duplication of parts is obvious". (Office Action at p.6). However, a mere duplication of parts is not claimed. The division of a second chamber into (at least) six subcompartments is claimed. This is not a mere duplication of parts, but rather a significant subdivision of an existing structure. There is no motivation or suggestion to add more partitions to Notman....

“ (page 13-14)

In response, the Examiner notes that claims 3-6 are strictly relegated to reproducing, not “dividing” or subdividing, already existing parts in dependent claims 1 and 2 for example.

Indeed, Applicant's reactant space (12; Figure 1) is not an apparatus part so such a subdivision of said space is itself not a structural limitation either explicit or implicit. The Examiner thus maintains his rationale for motivation that reproduction of parts is considered obvious. Indeed adding three more of Notman's catalyst support grids (16A-C -> 16A-F) would directly translate in Notman's apparatus to producing more methanol due to the scaled up surface area of both the catalysts and reaction volume.

Applicant states (page 15):

"

First, contrary to the Examiner's assertions, Notman does not suggest the desirability of providing longer residence time for the flowing gasses. Second, and perhaps more importantly, Notman does not suggest that the use of partitions having offset largest orifices would provide longer gas residence time.

...

Nowhere in the above cited passages is there any remote implication that there is a desire to increase gas residence time. There certainly is no teaching or suggestion in the prior art that positioning two large orifices in partitions such that they are offset with respect to each other constitutes a desirable or efficient manner to increase gas residence time.

"

In response, the Examiner believes his grounds of rejection are sound because of the specific teaching in Notman of a critical gas flow reactor metric called the "volume space velocity" (column 4; lines 9-17). Specifically Notman cites values of 5,000 to 50,000 $hour^{-1}$. The *dimension* cited by Notman's "volume space velocity" suggests that Notman, as well those of

ordinary skill in the art, know the relationship between flow rate, volume, and time: Q (volume/time) = (reactor volume)x(volume space velocity) = (reactor volume)x(residence time)$^{-1}$. Thus the Examiner believes that in the context of Notman's discussion along column 4, both Notman and those of ordinary skill in the art would recognize that Notman believes it sufficiently important to discuss a description of how fast a gas traverses his reactor as a "volume space velocity" of 5,000 to 50,000 hour^{-1} and equivalently how long a gas takes to traverses his reactor as a residence time of said "volume space velocity" as $2E^{-4}$ to $2E^{-5}$ hour. As one in the prior art would recognize, such a metric would necessarily be identified as a result-effective-variable whose value is directly influenced by optimizing Notman's hole size dimension(s).

Applicant states:

"

Moreover, the configuration of the Notman device is such that a constraint as to the location of hole in one partition with respect to a hole in the next partition is of no consequence. Specifically, all of the gas that passes through the catalyst bed and the partition 16A is directed to the spargers 28A located next to the tube 26. (Notman at column 8, lines 17-20 and FIG. 3).l Thus, regardless of the location of a hole in the partition 16a through which gas passes, the gas must first travel past the spargers 28A before traveling to the next partition. This is shown in FIG. 3, a portion of which is set forth below.

"

And ...

“

The baffle 29 then distributes the gas over the next catalyst bed. (Notman at column 8, lines 21-23 and FIG. 1). Thus, the relative alignment of holes in the partition 16A with respect to the partition 16B has no affect on residence time since all gas passing through the partition 16A must travel around the spargers 28A and over the baffle 29 before encountering the partition 16B.

“

In response, the Examiner agrees with Applicant's interpretation of Notman's Figure 3 that gasses passing across 16A-C indeed are required to pass across surface 22A-C, however, Applicant is incorrect that optimizing hole diameters in 16A-C *would not* influence residence time. This is equivalent to saying that plates 16A-C provide zero drag on the flowing gas, and this is fundamentally wrong. Optimizations in hole diameters in 16A-C would directly influence the result-effective variable that is residence time or Notman's “volume space velocity”.

Applicant states:

“

Rather, providing a single "largest" hole in a partition would most likely degrade the performance of the catalyst bed since the reduced resistance to flow through the larger hole would cause gas to preferentially flow through that hole, causing an increased amount of reaction in the catalyst bed near the hole. The locally increased reactions would lead to localized burnout of the catalyst bed near the largest hole. Of course, once bum out about the largest hole occurs, the catalyst bed must be replaced even though catalyst located near the other holes in the partition would still be active. This results in decreased catalyst bed life, increased costs and

increased maintenance requirements. Accordingly, one of ordinary skill in the art would not be motivated to provide a "largest" hole in the partitions of Norman.

"

In response, Notman already shows a "single largest hole" in each of his plates 16A-C. Notman's single largest whole in 16A-C is show in each plate as accommodating piping 26, Figure 3. Such an arrangement is apparently *not* objectionable to Notman's overall design and catalyst bed according to Applicant's contention of "localized burnout" of the catalyst.

Applicant states (page 19):

"

Notman does not disclose a first orifice as recited in claim 22. In the Office Action, the Examiner alleged that the catalyst beds 12A and 12B of Notman constitute the claimed first and second chambers while the grid 16a was a first partition as claimed and that it has a first orifice ("central hole") that constitutes the first orifice (Office Action page 3). This central hole is the opening through which the tubes 26 and 42 pass. (See Notman, FIG. 1, reproduced on page 17 of this brief). Thus, the Examiner alleges that gas passes from the catalyst bed 12A to the catalyst bed 12B through the tubes 26 and/or 42. The Examiner has mischaracterized the nature of the tubes 26 and 42....

Instead, gas only passes from the first chamber (catalyst bed 12a) to the second chamber (catalyst bed 12b) through off-center holes 16a. These off-center holes are not aligned with the longitudinal axis of the enclosure. (See Notman, FIG. 1 and FIG. 3). Gas passing into and/or out of the tubes 26 and 42 from the catalyst bed 12a would completely destroy the circulation pattern in the Notman device.

" (Pages 19-20)

In response, the Examiner reiterates his citation of Notman's first orifice ("central hole"; column 2, lines 1-15; column 7, lines 3-7). As such no other hole in Notman's plates 16A-C are disclosed to by the central hole *except* for Notman's first orifice ("central hole"; column 2, lines 1-15; column 7, lines 3-7). Applicant above statements does not correctly interpret Notman's Figure 3 as even reproduced by Applicant's brief at page 17. In particular, it is completely clear that the Examiner *has not* suggested that gas passing through Notman's catalyst beds 16A-C are conveyed *inside* of Notman's piping 26. Notman's Figure 3 clearly shows an offset from each of plates 16A-C from pipe 26 which the Examiner has designated as the first orifice ("central hole"; column 2, lines 1-15; column 7, lines 3-7). As shown, Notman's first orifice ("central hole"; column 2, lines 1-15; column 7, lines 3-7) is the largest orifice for each of his plates 16A-C and are aligned, but not staggered as Applicant's claims require. Because of lack of staggered first orifice ("central hole"; column 2, lines 1-15; column 7, lines 3-7) as largest holes the Examiner proposed that optimization of hole sizes, as a result-effective variable, would necessarily be obvious to influence Notman's "volume space velocity".

With respect to the Examiner's combination of Mundt and Notman, Applicant believes that there is no motivation to combine the references at pages 23-24. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958

F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Examiner believes that the references and the level of skill in the art provide teaching, suggestion, and motivation for the combination found both in the references themselves and in the knowledge generally available to one of ordinary skill in the art. In particular, it is of no surprise that catalysts such as those used in Notman's *catalytic reactor* are employed at the effluent side of many reactor systems such as for example, combustion engines and chemical manufacture as in Notman to either remove the toxicity of the processing gas and/or comply with the Federal Clean Air Act of 1990[1].

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Rudy Zervigon (Primary Examiner, Group 1792) 11/13/7

Conferees:

Parviz Hassanzadeh (SPE Group 1792)

PARVIZ HASSANZADEH
SUPERVISORY PATENT EXAMINER

Romulo Delmendo (QAS TC 1700)

[1] http://epa.gov/air/caa/